

## SOUNDBEAM® – A RESOURCE FOR MUSIC AND MULTIMEDIA PERFORMANCE

“... the possibilities afforded by Soundbeam®, both in terms of electronic music and multimedia live performance technology, and its possibilities for group music in which all participants are actively involved in the process of music making, provide classroom teachers with new means of developing their pupils' creative imaginations in many directions across the curriculum.”

**Professor Helen Coll and Ted Bunting,**  
UCE Birmingham

Electronic and digital technology is nowadays one of the principal keys to giving school students access to live music making and multimedia performance, and the creative achievements and pleasures of composition in sound and vision.

Soundbeam® – with other music and multimedia technology – now offers teachers and students new opportunities for contemporary forms of composition and group music-making, less costly – but no less expressive.

A group of 12 Soundbeam® players (4 Beams and 8 Switches) – with comparatively little training – can form a useful nucleus for ensemble music-making and multimedia projects, able to call up and control a huge range of sounds and images – and provide a powerful stimulus to student creativity.

Students of all ages and abilities, in mainstream and Special schools and colleges can collaborate with students and groups with vocal or other instrumental skills, in developing and performing aesthetically satisfying musical and multi-media pieces. Its value to schools which are currently developing ‘inclusive’ facilities should need no emphasis.

“... We've actually got to think about the costs – 3 really good orchestral instruments could set you back the same amount of money, with less possibilities – as well as not being ‘street cred’ as far as the boys are concerned.”

**Mike Parrott,** Group Manager for Arts and Development,  
Walsall Education Authority



“... it allowed a lot of the children to do things that they couldn't do ... it wasn't like the recorder players who could already play things ... this was new to everybody, so everybody started from the same place.”

**Kartherine Curd,** Specialist Music Teacher,  
Leighwood Primary School, Walsall

Soundbeam's ultra-sonic Sensors convert body movements, – hands, arms, head, legs, feet or the whole body – into sound analogies based on their direction and speed. They combine with the operations of the Switches to produce 12 separate, simultaneous but independent musical outputs.



The various pitches, scales, chords, arpeggios and other sequences assigned to interpret the individual outputs of the Soundbeam® players can be organised into considered harmonic, melodic, rhythmic and timbral relationships, with unified key structures, and tuning which can easily be adjusted to the intonation of other electronic and acoustic instruments.



In this way, up to 12 students of different abilities – controlling a varied palette of original sounds and musical timbres and harmonies - can join actively in sophisticated forms of ensemble music-making, with all the benefits for aural training, understanding of musical forms, aesthetic appreciation and creative development which participation in this kind of activity offers.



In addition, Soundbeam® players can form part of larger musical forces, with voices (sung and spoken), percussion, recorders, guitars, and other acoustic or electronic instrumentalists. Dancers' movements, too, can be used to generate a musical input.



### SOUNDBEAM® AND MULTIMEDIA

“...Children are coming to understand much more the inter-disciplinary nature of making something with multi-media.... They retrieve and manipulate their work, hobbies, and games on computers, and are familiar with interactive DVD material. They also possess the ability to read the multi-lingual language of the TV pop video – the mixed-media package of image, text, music, graphics, drama, dance and art.”

**Martin Kiszko,** composer, “INUA”



With Soundbeam's MIDI outputs connected to commercial visual software, it becomes possible for movements in the Beams, and activation of the Switches, to call up video clips and other graphic samples – and to modify and transform these images in real time, immersing the audience in a complete audio-visual experience.



In this way, body movements in Soundbeam's ultra-sonic sensors can be used to “play” still images, animations, video clips, live video feeds and special effects – and Soundbeam's potential can be harnessed to generate amazingly powerful and dramatic real time, inter-active conjunctions of sound and image, creating a wide range of imaginative and exciting possibilities.

The ability to create dazzling interactive graphic imagery takes live performance, dance, drama and other multimedia productions to new levels of creative expression.



Soundbeam gives us in the visual arts a chance to work with groups and the moving image in a live interaction that challenges traditional notions of ownership and sensitivity to the work of others. We are excited about using it in multi-media approaches, in performance art and in installation pieces that reflect some of the more adventurous contemporary practices in the visual arts.

**Linda Hunter,** Head of Art,  
Backwell School, North Somerset

### SOUNDBEAM® ACROSS THE CURRICULUM

There are many possibilities for cross-curricular work with Soundbeam®. Devising multi-input demonstrations of current topics derived from English literature, History, Geography, Science, Art, as well as Dance, Drama, Music and Music Technology and Music Technology, can suggest very rewarding ways of presenting new ideas in these subjects.

“...I was amazed at the technology, and I think it had an enormous impact on the kids ... The kids were quite frightened of it (to start with), ... (but) they adapted to using it, and obviously got a great deal of enjoyment out of using it, and particularly finding the position of things.”

**John Haydon,** Head of Science,  
Bishop Perowne High School, Worcester

### INCLUSION – SOUNDBEAM® IN SPECIAL EDUCATION

Soundbeam® has a long history in Special Education. It is the ideal instrument for enabling many students with SEN to enjoy group music-making on equal terms with other student players.



“... One of the most important things is it's a mechanism for inclusiveness. It can be inclusiveness within a particular cohort of children, it could be a means of getting different groups of children to come together. Obviously we do use Soundbeam® a lot with the special schools, and ...if you actually questioned a pupil from our special schools, (they would say) “Yes, I play the Soundbeam®.” I suppose they've become dexterous and used to those mediums, and they would certainly regard Soundbeam® and other processes being used as being just as valid and just as natural as the clarinet or kit or whatever...”

**Mike Parrott,** Group Manager for Arts and Development,  
Walsall Education Authority



“The Desktop Soundbeam® is brilliant. The flexibility of the MIDI control system and the visual clarity of the interface makes it a joy to work with. In fact, it's so good that after only one training session the teachers at Kenilworth Nursery are programming their own patches to allow the kids to do their own sound effects for stories and circle time.”

**Mike Roberts,** Warwick Music Services

“...the joy for me ...was that this was not a hand-picked bunch of kids, this was a complete mixed ability form all working together. I just felt that was a real way forward.”

**Stephen Tommey,** Head of Performing Arts,  
Bishop Perowne High School, Worcester

“I really do believe that (using Soundbeam®) is a process by which children can be brought in to making music ...with potentially less initial barriers.”

**Mike Parrott,** Group Manager for Arts and Development,  
Walsall Education Authority

“...But yes, their music is far better than the other Year 8 groups because of that... It has helped their composition, way of working and everything really”

**Nicola Raggett,** Head of Music,  
Bishop Perowne High School, Worcester

“I think it's given some of the children the opportunity to shine in ways they wouldn't have shone in the classroom. Given them the chance to see each other in a different light because they're seen to be shining in something, whereas normally they wouldn't be seen by the others to have (any) particular talents...”

**Helen Smith,** teacher Class 4S,  
Leighwood School, Walsall.

“I don't see any reason why Soundbeam® can't be used in schools as an instrument that you learn, and can be invited into the school orchestra just like any other instrument. I can't see any reason for that at all, really.”

**Martin Kiszko,** composer, INUA

### SOUNDBEAM® THE KEY STAGES AND THE NATIONAL CURRICULUM

Soundbeam® offers opportunities for covering a wide variety of specific areas of the National Curriculum in Music and Art, in all Key Stages – as well as tremendous potential in Dance and Drama courses, and for exploring innovative solutions to the technical components of Performing Arts and Theatre Design, and its implications for IT.

#### PHYSICAL EXCITEMENT WITH AESTHETIC EXPERIENCE – the Instinctive Relationship between Movement and Play

“Instruments such as Soundbeam® ...permit an engagement with the control of sound which is especially suitable for developing the responses of children. According to Gardner (1983, 1999) human beings are able to develop and integrate several independent intelligences, including capacities he designates ‘spatio-temporal’, ‘social’ and ‘musical’. The characteristic of Soundbeam® and other elektrokinesthetic devices is their unique and innovative elicitation of behaviours which engage these aspects of human intelligence”  
“Soundbeam® in Walsall”

“... Such new instruments extend the kind of instinctive relationship between movement and play described by Winnicott (1971) as essential to child development.

They offer a means of reconciling physical excitement and aesthetic experience made all the richer, more flexible and more accessible by the capacity of digital information to permit infinite variation of both sonic output and kinaesthetic control”  
“Soundbeam® in Walsall”

**Dr Nicholas Bannan,**  
International Centre for Research in Music Education,  
The University of Reading







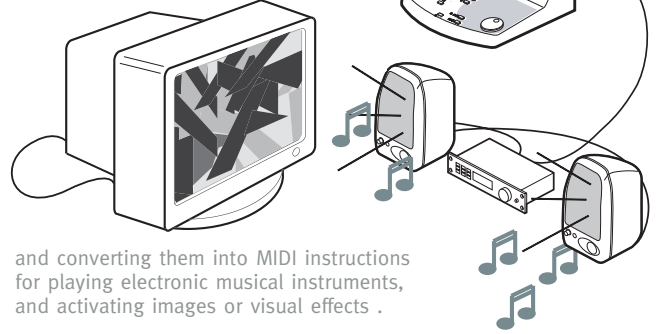
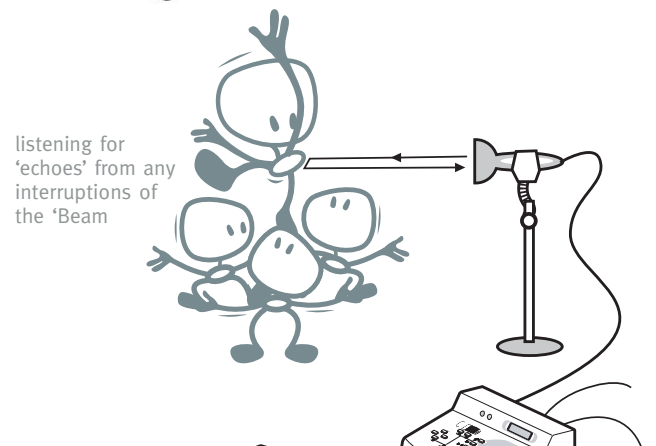
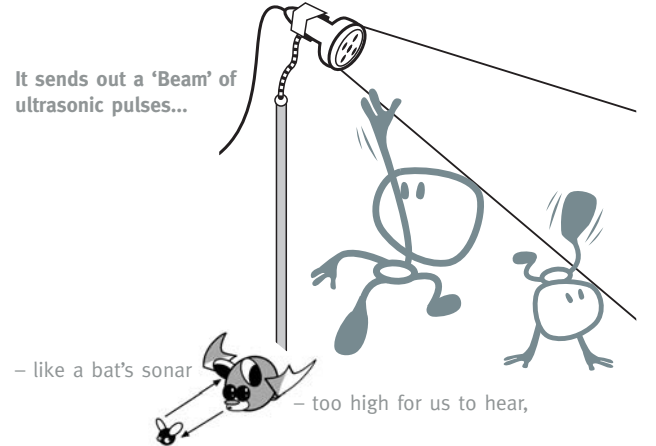
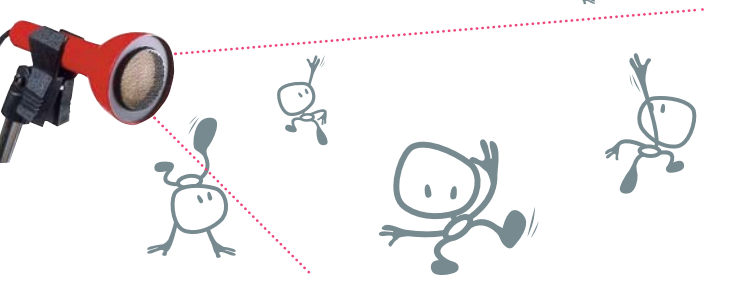
# WHAT IS SOUNDBEAM®?



# SOUNDBEAM® in schools

the invisible, expanding keyboard in space

- CREATIVITY
- MUSIC
- MULTIMEDIA
- INCLUSION



WWW.SOUNDBEAM.CO.UK

Soundbeam® converts your physical movements into sound, images or visual effects – without contact, at distances of up to 6m.

A new, accessible way of playing sound modules, keyboards, samplers, sequencers, sound processors – and software graphics programs.

Enables expressive live performance with instrumental and jazz and world music – and a whole range of exciting and original sound transformations you can make yourself.

Projected video images and visual effects modified and combined in real time performance.



## HOW SOUNDBEAM® WORKS



### SENSORS AND SWITCHES

Up to 4 ultrasonic Sensors detect movements in the Beams. The Range of each Beam can be varied independently from 0.56m to 6m.

Information from the Beams and up to 8 Switches translates into MIDI instructions for sound modules, keyboards, samplers and other MIDI input sound and visual devices.

## THE NOTES

Factory-preset sequences of single notes or chords – scales, arpeggios, chord sequences – are stored in Soundbeam's memory. New ones can be played in from a MIDI keyboard.

Each Beam is divided into the same number of Divisions as the number of notes/chords in the selected sequence. Each note or chord is assigned to one Division of the Beam.

PITCH SEQUENCE No. 040 "SCOTTISH FIDDLER"

BEAM divided into 22 DIVISIONS

## TRIGGER MODES

Different ways of articulating the sounds – short, staccato notes or a variety of longer, sustained, overlapping ones – are controlled by the Trigger Mode setting.

They can also be used to manipulate images, image sequences and lighting in similar ways.

## TRANSPOSITION

The notes or chords of any selected sequence can be Transposed up or down by up to 36 semitones (*more in the Desktop version*). Alternatively, the notes or chords of all the sequences currently selected to interpret all the Beams and Switches, can be subjected to a Global Transposition up or down by the same amount.

One Beam or Switch can be set to transpose the sequence allocated to another Beam or Switch – or, globally, all Beams and Switches." (*Desktop version only*)

## MIDI

MIDI Program Numbers select the various sounds/timbres which can be called up from the MIDI musical instrument connected to Soundbeam®. The sounds are easily changed and tried out with the current Pitch Sequence.

The two MIDI Control Chains can be used to control independently, in real time, two basic expressive characteristics – volume, vibrato, pitch-bend, reverb, attack, decay etc.

System Exclusive MIDI messages can be recorded via one of the 3 MIDI Inputs, and used to interpret information derived from the Beams or Switches. A movement in the Beam could trigger a MIDI file for sound, image or lighting.

Users can define their own custom MIDI messages. Interruptions of any Beam or activation of any Switch can trigger a MIDI file for a musical accompaniment or drum loop.

## SET-UPS

Collections of all the settings – at any one time – for all 4 Beams and 8 Switches can be saved as Set-ups. Each Set-up contains all the settings necessary for activating a particular factory-preset soundscape – "Haunted House", "Outer Isles", "Seascape", "Pentaset", "Eastern Reverie", for example – or sections of a longer sound or multimedia piece.

Users can create and save their own user-defined Set-ups for instant recall and activation.

Visual software used with Soundbeam® allows similar manipulation of visual effects to be applied to recordings or live input.

Set-ups can also be programmed to be recalled in any order, and any number of them can be cycled and recycled in this way – either via two of the 8 Switch inputs, or in the form of MIDI Program change messages sent via the MIDI Inputs. (*Desktop Soundbeam® only*).



## THE MIDI INSTRUMENTS

Soundbeam® 2's MIDI outputs can be connected to keyboard synths, sound modules, samplers, sound processors etc.

The Desktop Soundbeam® can also access their software versions, together with software soundcards, sequencers and sound processors.



## THE SOUNDS

The sounds and timbres articulated by Soundbeam® in live performance can be taken from

- Banks of sounds stored in sound modules and keyboards;
- Banks of samples from commercial firms; or
- Sound samples specially developed, recorded and processed by teachers, composers, students, sound designers and other Soundbeam® users

## THE IMAGES

Articulating music and sound is only one of the uses of Soundbeam's MIDI outputs. Information from Beams and Switches can be applied (via commercial software) to transform and layer video clips, stills scans, live video input and text, in live performance. It can also be used to control lighting systems in theatre and dance performances, and there are many other potential applications in dance, drama, education, performance arts, and exhibition installations.



## SOUNDS FROM WORLD MUSICS

The sounds which can be sampled and articulated by Soundbeam® include all sorts of musical instruments from around the world.

Bansuri, santoor, sarangi, sarod, sitar, tabla, tambura, mbira, koto, shaku hachi and other wind, string and percussion instruments, harps, bells, gongs, 'pans', are all commercially available as samples, and their sounds can be articulated in live performance, using body movements in Soundbeam's 'beams' of ultrasonic pulses, or from switches, keyboards, joysticks.

## USER-MADE SOUND SAMPLES

Imaginative, original sound transformations can be developed by applying various electronic sound processes to selected samples. They are valuable sources of sounds for articulation via Soundbeam®, since they can be wholly specific to the needs of a particular piece.

Students gain a great deal, musically and educationally, from participating in the process of helping to devise and make the sound and visual samples themselves, empowering them with strong feelings of creative ownership – of being, themselves, the originators, composers and owners of the samples they are going to play, as well as offering useful analytical insights into the components and structures of various timbres and musical cells.

"... As a resource for performances I think it's an invaluable tool."  
**Stan Partington, Head of Music, Alsop High School, Liverpool**

